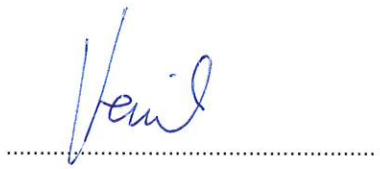
EMC TEST REPORT

FCC 47 CFR Part 15B, ISED ICES-003 Issue 7

Report Reference No	G0M-2002-8799-EF0115B-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A-2 DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Robert Bosch Tool Corporation
Address	1800 W. Central Road 60056 Mount Prospect, IL USA
Test Specification Standard(s)	47 CFR Part 15 Subpart B ISED ICES-003 Issue 7-2020 ANSI C63.4:2014+A1:2017
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Laser Rangefinder
Model(s)	GLM165-27CG
Additional Model(s)	None
Brand Name(s)	BOSCH
Hardware Version(s)	Main PCBA v0.6 (BOM 08.06.20); CF340 PCBA v11 (BOM 03.01.20)
Software Version(s)	MCU 0.5.2, Bluetooth 1.6.0
FCC-ID	TXTGLM1652XX
IC	909H-GLM1652XX
Test Result	**PASSED**

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	N/R	
required by standard but not appl. to test object	N/A	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Date of receipt of test item	2020-09-16	
Report:		
Compiled by	Matthias Handrik	
Tested by (+ signature) (Responsible for Test)	Matthias Handrik	
Approved by (+ signature) (Deputy Head of Lab)	Jens Marquardt	
Date of Issue	2020-12-21	
Total number of pages	65	
General Remarks:		
The test results presented in this report relate only to the object tested. **The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.** This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		

Additional Comments:		
Additional variants of AC/DC adaptor and Li-Ion pack have been declared by the manufacturer. The listed AC/DC adaptor and Li-Ion pack were not tested, evaluated or assessed in no way.		
AC/DC-Adaptor	Model:	1600A0143H
	Vendor:	Bosch
	Input:	100-120V AC
	Output:	5V DC
Li-Ion pack	Part Number:	1607A350N9
	Model:	BA3.7V1.0AhA

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
T_{NOM}	Nominal operating temperature
V_{NOM}	Nominal supply voltage

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2020-12-21	Initial Release	-

REPORT INDEX

1 Equipment (Test Item) Under Test

Description	Laser Rangefinder	
Model	GLM165-27CG	
Additional Model(s)	None	
Brand Name(s)	BOSCH	
Serial Number(s)	030600072	
Hardware Version(s)	Main PCBA v0.6 (BOM 08.06.20); CF340 PCBA v11 (BOM 03.01.20)	
Software Version(s)	MCU 0.5.2, Bluetooth 1.6.0	
FCC-ID	TXTGLM1652XX	
IC	909H-GLM1652XX	
Class	Class B	
Equipment type	Table top	
EUT Dimension cm [cm]	11.8 x 5.2 x 2.8	
Highest internal frequency [MHz]	2480 MHz (Bluetooth) 730 MHz (clock)	
Radio Module	Type	Bluetooth Low Energy module
	Model	Unspecified
	Manufacturer	Unspecified
	FCC-ID	Unspecified
	IC	Unspecified
Supply Voltage	V_{NOM}	3.0 VDC (alkaline battery 2x1.5V(AA))
	V_{NOM}	3.7 VDC Li-Ion pack (1607A350N8 / BA3.7V1.0AhA)
	V_{NOM}	5 VDC dedicated AC/DC adaptor
AC/DC-Adaptor	Model	2609120713
	Vendor	Bosch
	Input	100-240V AC
	Output	5V DC
Manufacturer	Robert Bosch Power Tools GmbH 70538 Stuttgart Germany	

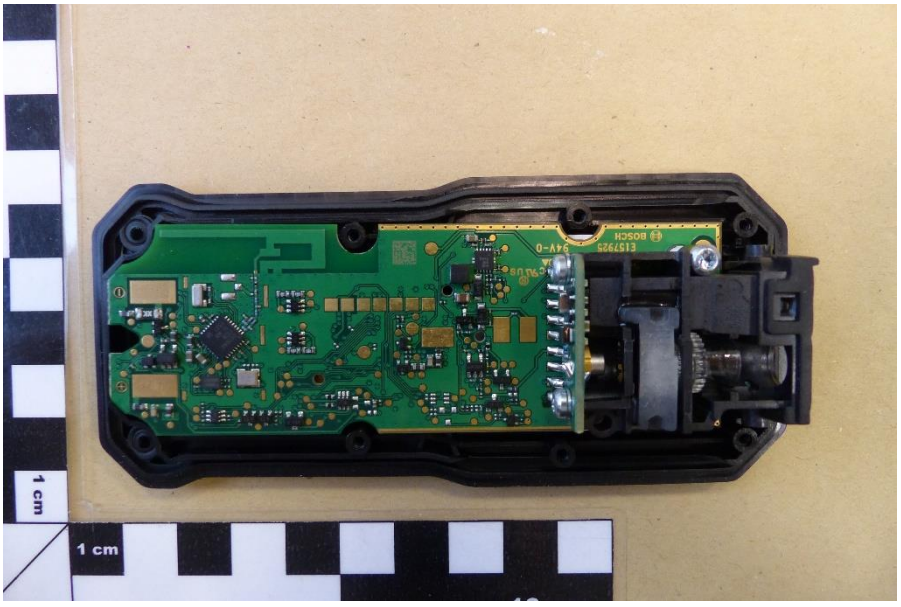
1.1 Equipment Ports

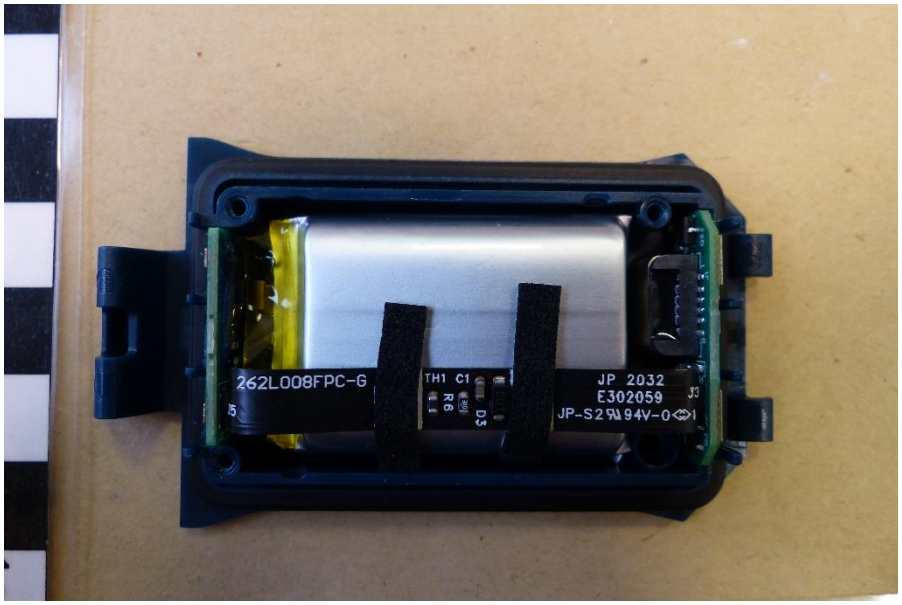
Name	Type	Attributes		Comment
Power	AC	Count: Direction: Max. cable length [m]: Shielded: Service only:	1 In unspecified No No	-
Power	DC	Count: Direction: Max. cable length [m]: Shielded: Service only:	1 In 1 No No	Charging via USB-C cable: 1 600 A01 6A8

Description:	
AC	AC mains power input/output port
DC	DC power input/output port
BAT	DC power input port connected to external battery
IO	Input/Output port
TP	Telecommunication port
NE	Non-electrical port

1.2 Equipment Photos - Internal

EUT PCB TOP


EUT PCB BOTTOM


EUT Li-ION PACK


1.3 Equipment Photos - External

EUT Top + Li-ION Pack + AC/DC adaptor


EUT Back


EUT Right

EUT Left

EUT Front

EUT Back

EUT Li-ION PACK TOP

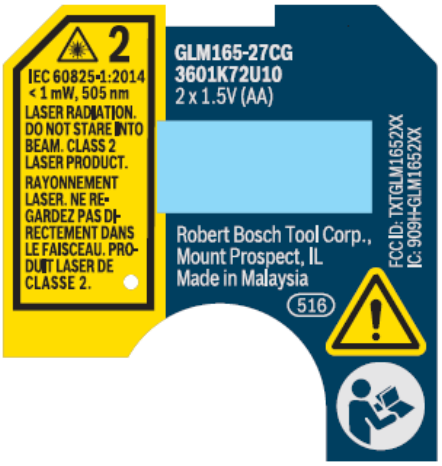

EUT Li-ION PACK BOTTOM


EUT AC/DC adaptor

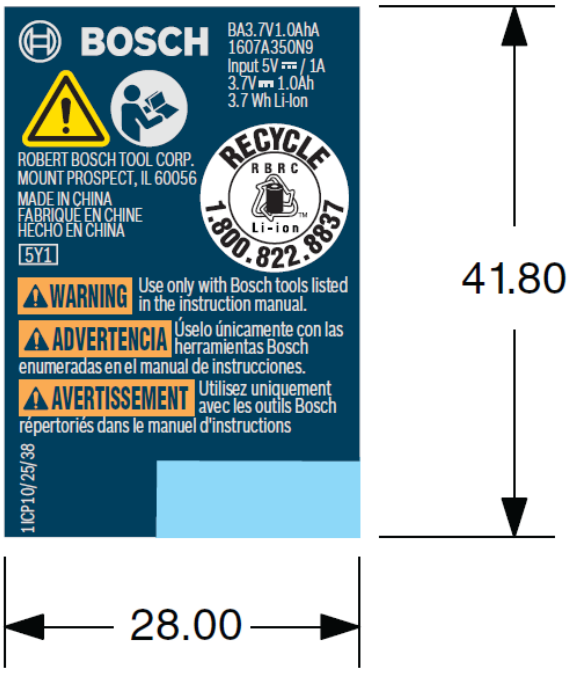

EUT AC/DC adaptor FRONT


1.4 Photos – Equipment Label

EUT LABEL[1]



LI-ION PACK LABEL[1]



[1]Provided by applicant.

1.5 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Smartphone	Motorola	Moto G NPP25.137-93	Customer support equipment
CBL	USB-C	Bosch	1 600 A01 6A8	Customer support equipment
AE	Software application	Bosch	Measuring Master	Customer support equipment
AE	AC/DC adaptor	Bosch	2609120713	Input: 100-240V AC Output: 5V DC
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				

1.6 Operational Modes

Mode #	Description
1	Bluetooth+PRO360 on, max. display brightness, white target at up to 10m: EUT continuous measure distance and transmit the measurement value via Bluetooth to Smartphone
Comment:	

1.7 EUT Configuration

Configuration #	Description
1	EUT powered via 2x1.5 VDC non rechargeable battery.
2	EUT powered via 3.7 VDC Li-Ion pack
3	EUT powered via 3.7 VDC, Li-Ion pack is connected via USB cable to charger and charging with 5V DC.
Comment:	

1.8 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyser in dBµV. Any external preamplifiers used are taken into account through internal analyser settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyser. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

Reading on Analyser (dBµV) + A.F. (dB/m) = Net field strength (dBµV/m)

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/m)

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dBµV + 26 dB/m	= 47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15B, ISED ICES-003 Issue 7				
Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
Emission				
FCC 15.109 ICES-003, 3.2.2	Radiated emissions	ANSI C63.4:2014 +A1:2017	PASS	-
FCC 15.107 ICES-003, 3.2.1	AC power line conducted emissions	ANSI C63.4:2014 +A1:2017	PASS	-
Comment:				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

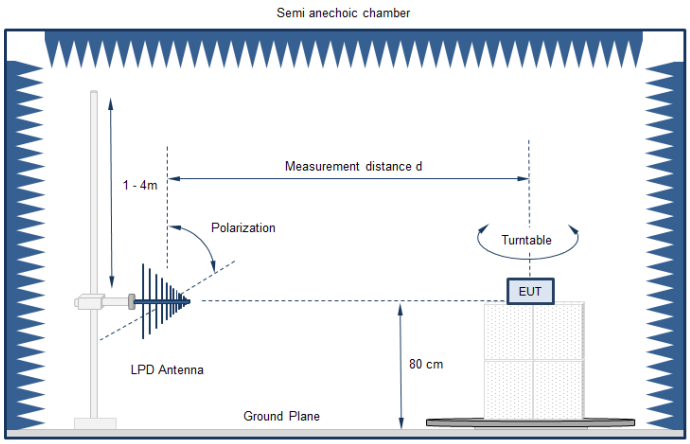
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

2.1.1 Information

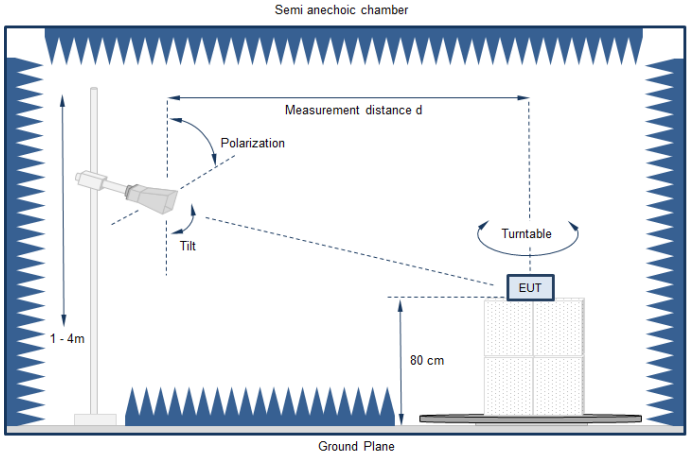
Test Information	
Reference	FCC 15.109, ICES-003, 3.2.2
Reference method	ANSI C63.4:2014+A1:2017 Section 8
Equipment class	Class B
Equipment type	Table top
Highest internal frequency [MHz]	2480
Measurement range	30 MHz to 12400 MHz
Temperature [°C]	22 ±3
Humidity [%]	38 ±3
Operator	Matthias Handrik
Date	2020-11-20
Comment	

2.1.2 Setup

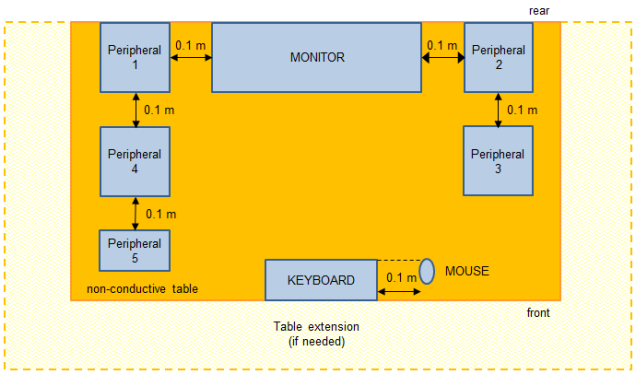
Measurement up to 1 GHz



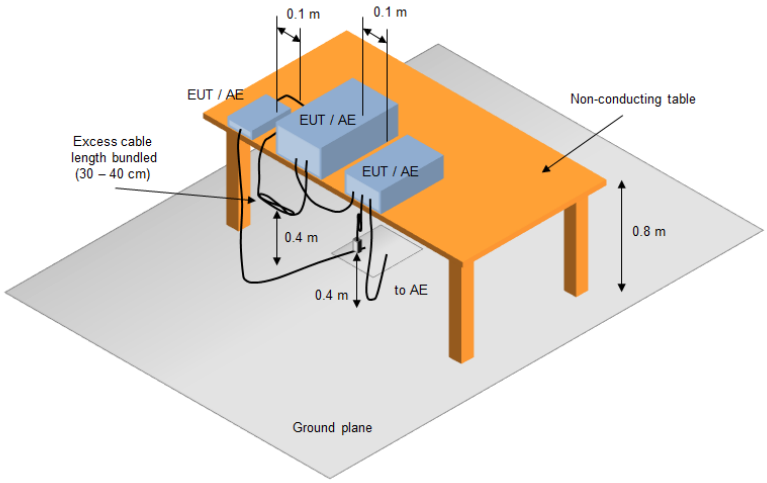
Measurement above 1 GHz



Equipment placement - Table top



Test Setup



2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC1	EF00062	2018-07	2021-07
EMI Test Receiver	Keysight	N9038A-526/WXP	EF01070	2020-06	2021-06
Biconical Antenna	R&S	HK 116	EF00030	2019-04	2022-04
LPD Antenna	R&S	HL 223	EF00187	2019-05	2022-05
Horn Antenna	Schwarzbeck	BBHA9120D	EF00018	2019-10	2022-10
Climatic Sensor	Embedded Data Systems, LLC.	280010000025417E	EF01054	2020-03	2021-03

2.1.4 Procedure

Exploratory measurement
1. The EUT was placed on a non-conductive table at a height of 0.8m. 2. The EUT and support equipment, if needed, were set up to simulate typical usage. 3. Cables, of type and length specified by the manufacturer, were connected to at least one port of each type and were terminated by a device or simulating load of actual usage. 4. The antenna was placed at a distance of 3 or 10 m. 5. The received signal was monitored at the measurement receiver. 6. This procedure has to be performed in both antenna polarizations, horizontal and vertical. 7. The arrangement of the equipment with the maximum emission level is shown on the setup picture at item 2.1.2

Final measurement
1. The EUT was placed on a 0.8 m non-conductive table at a 3 m distance from the receive antenna. The antenna output was connected to the measurement receiver. 2. A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast. 3. The EUT and cable arrangement were based on the exploratory measurement results. 4. Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded. 5. The test data of the worst-case conditions were recorded and shown on the next pages.

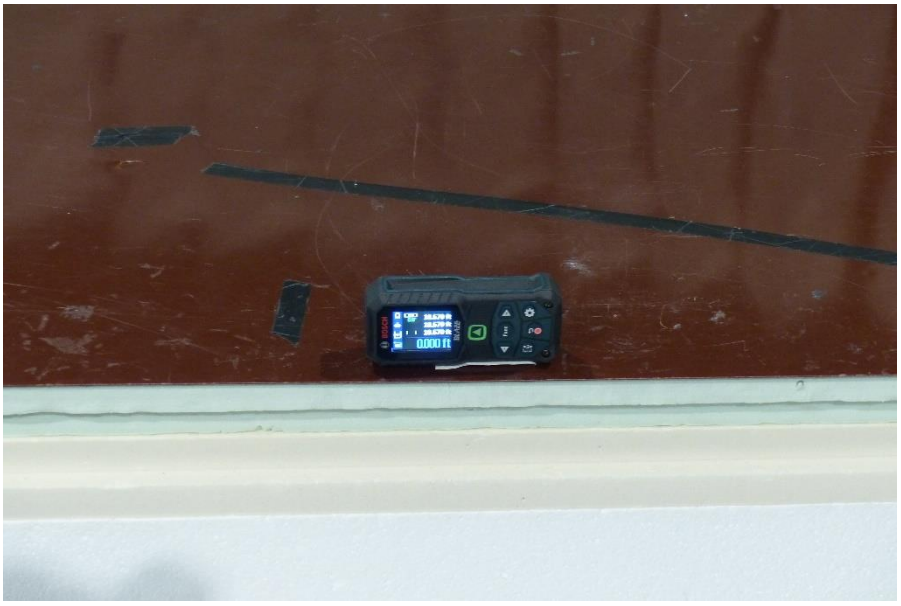
2.1.5 Limits

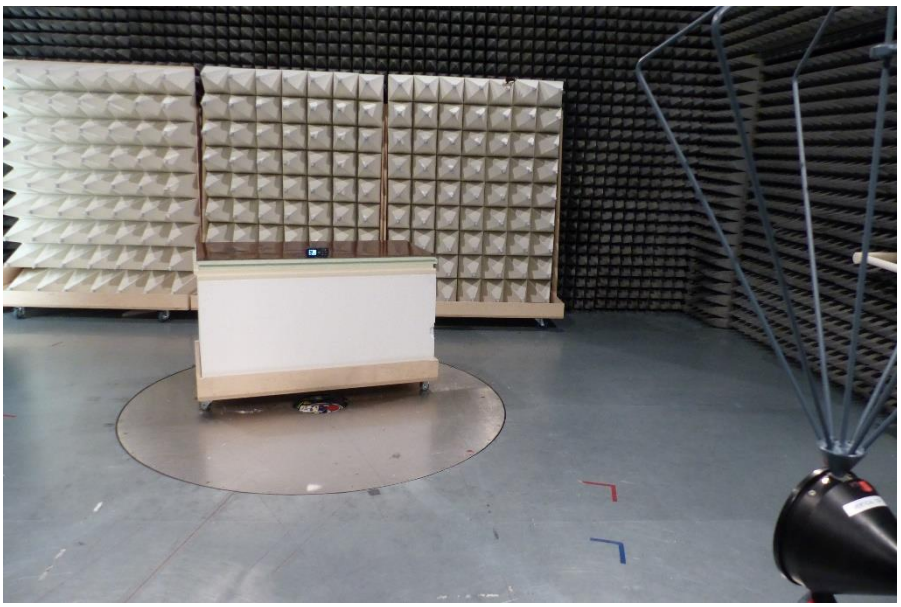
Class B @ 3 m		
Frequency [MHz]	Detector	Limit [dBµV/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak Average	74 54

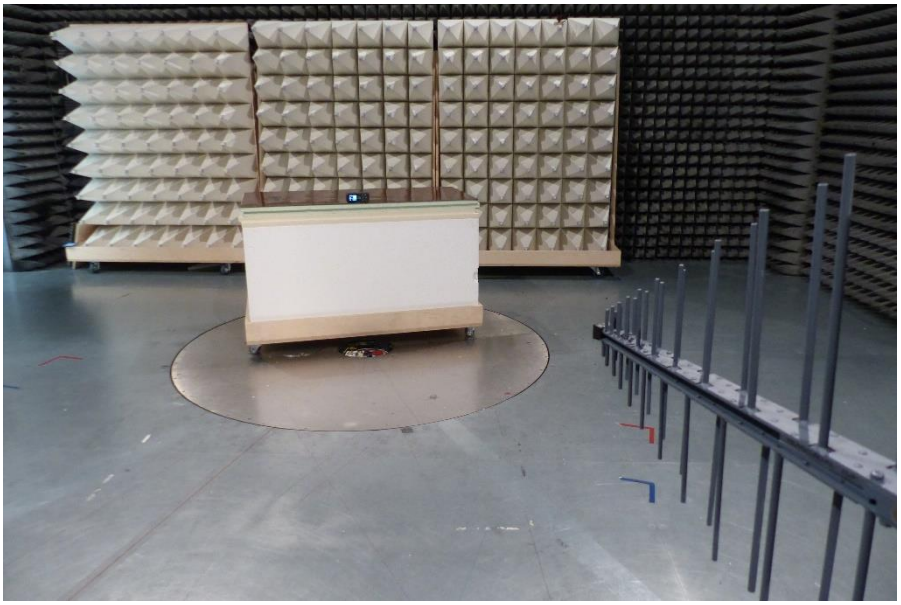
2.1.6 Results

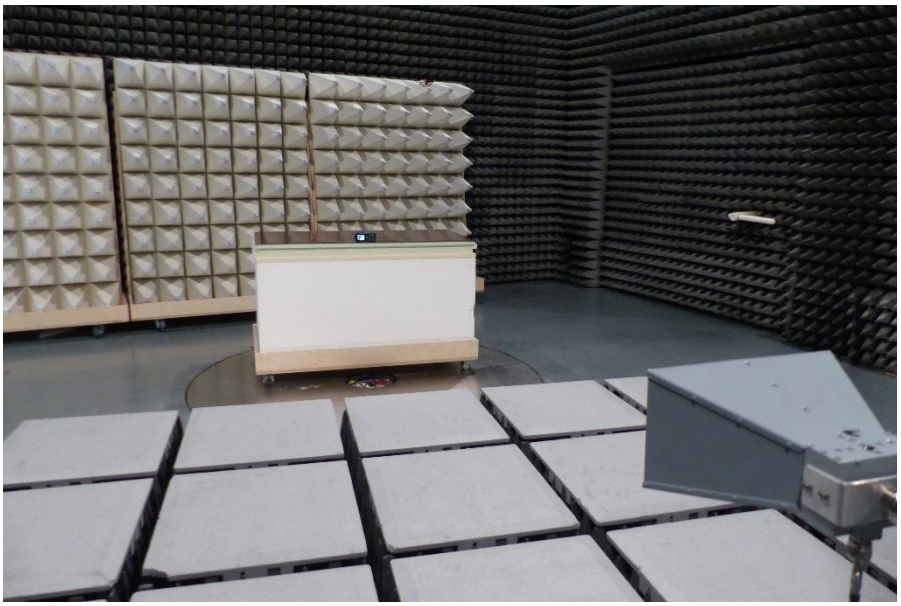
Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	-
1	2	PASS	-
1	3	PASS	-

2.1.7 Setup Photos

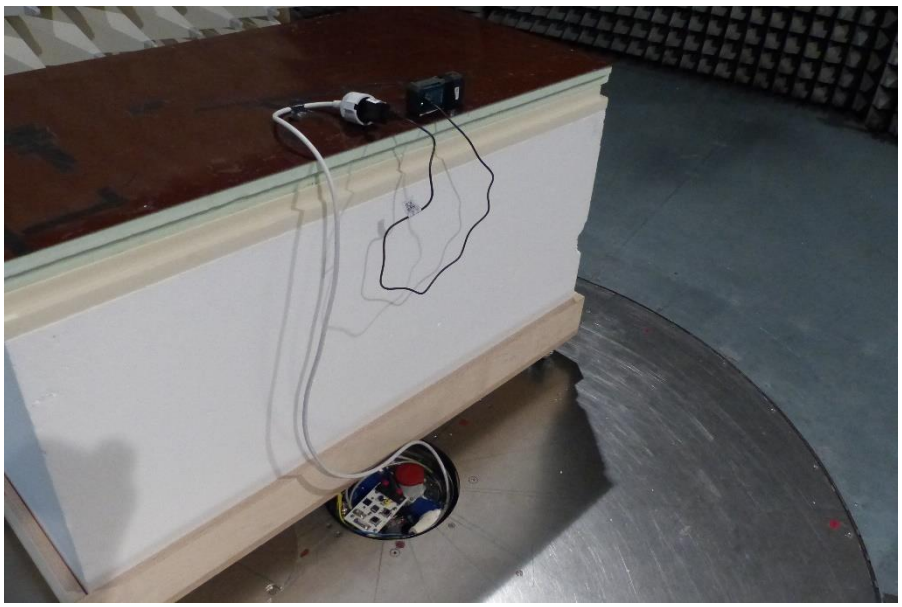
Test Setup EUT configuration 1, 2


Test Setup 30-200MHz EUT configuration 1, 2


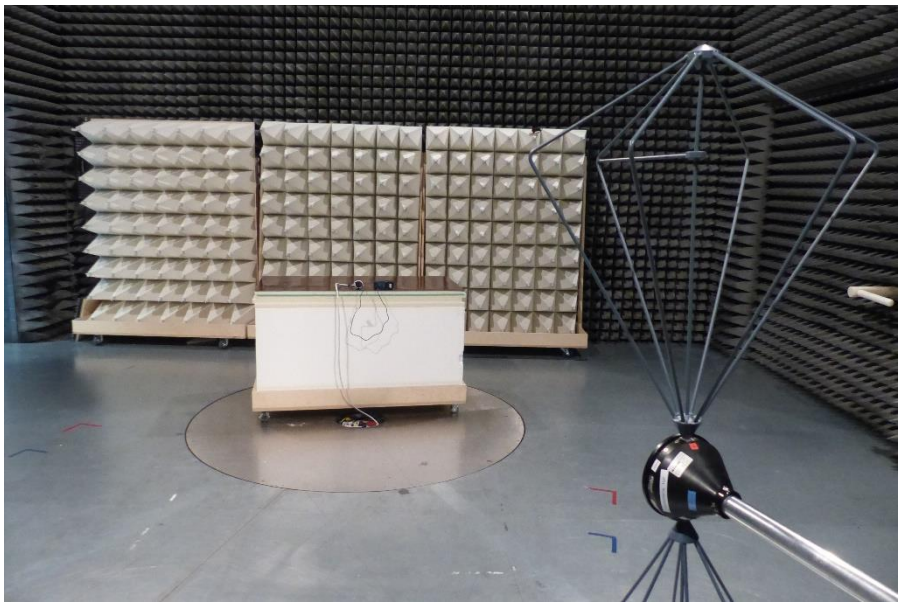
Test Setup 200-1000MHz EUT configuration 1, 2


Test Setup 1-13GHz EUT configuration 1, 2


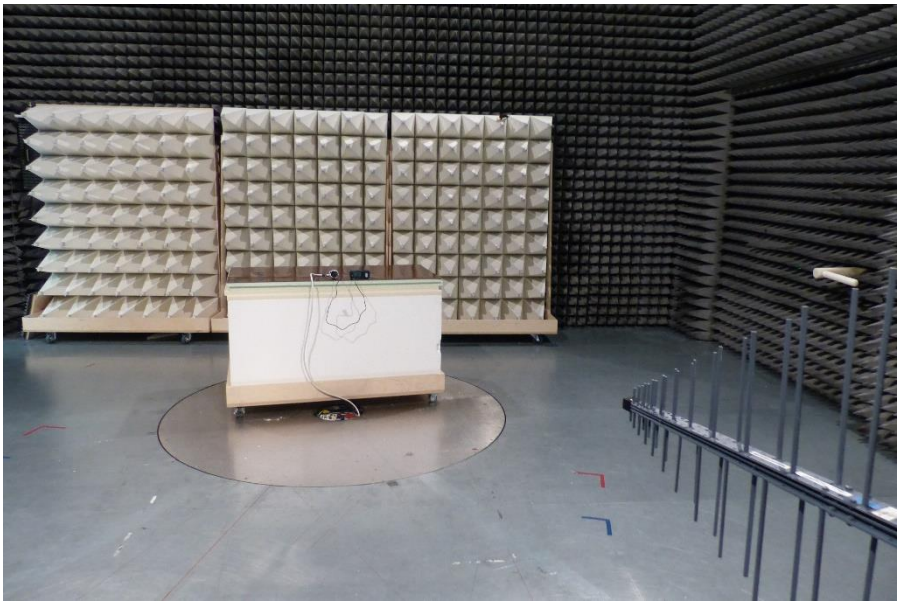
Test Setup EUT configuration 3



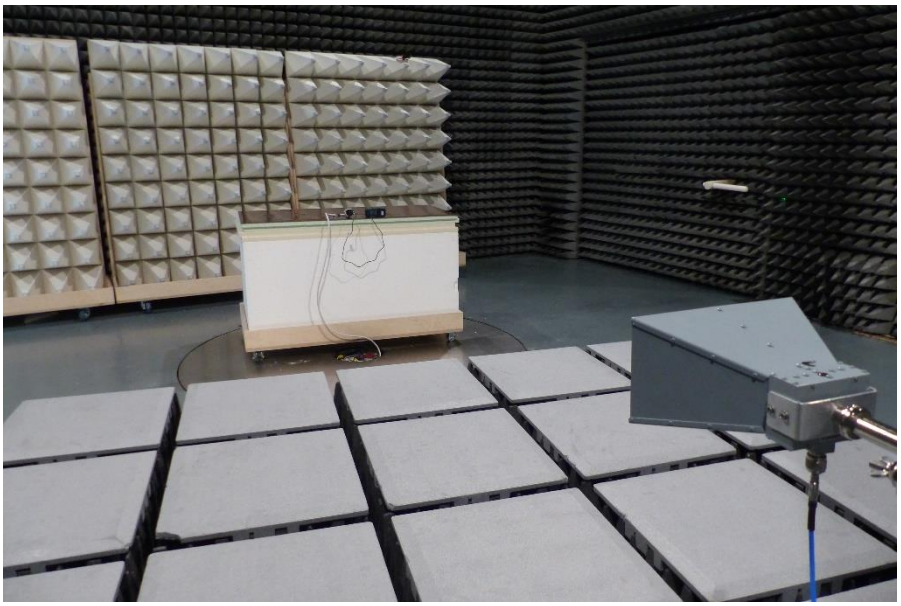
Test Setup 30-200MHz EUT configuration 3



Test Setup 200-1000MHz EUT configuration 3



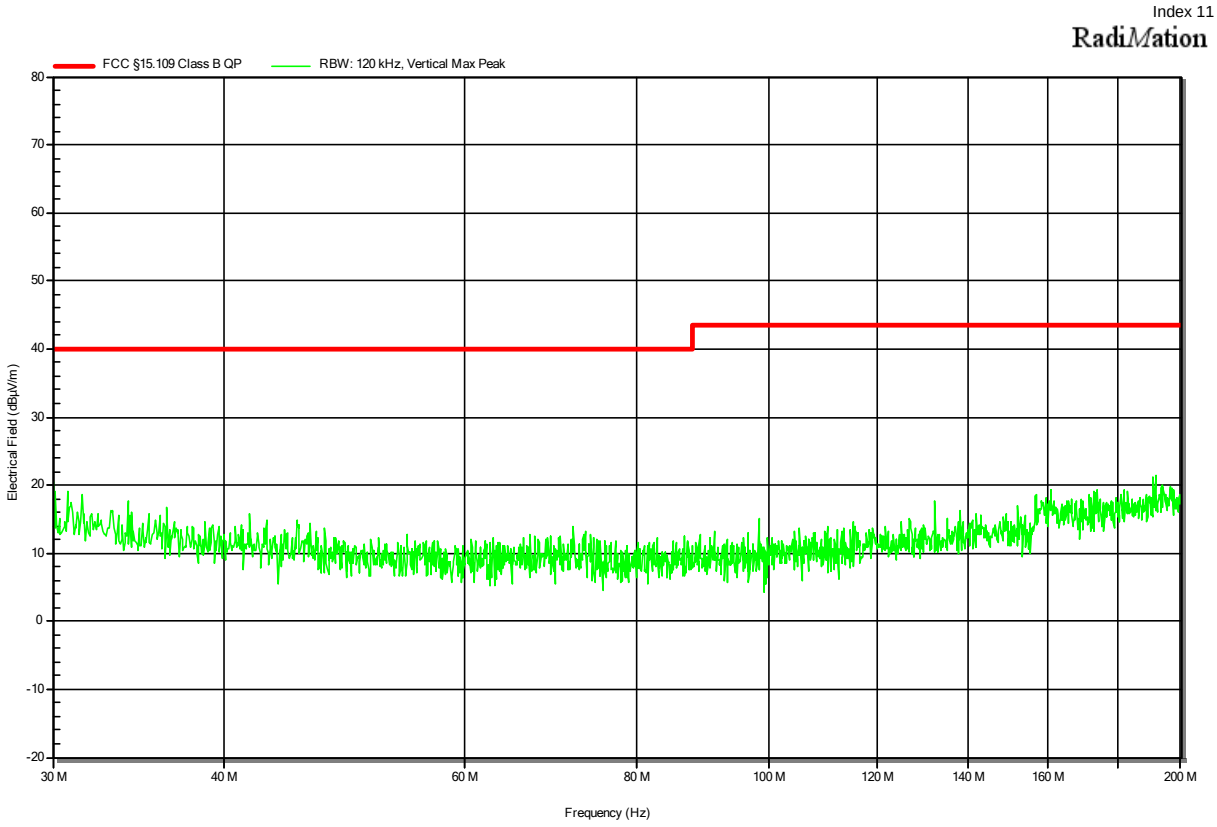
Test Setup 1-13GHz EUT configuration 3



2.1.8 Records

Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 2x1.5V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 1
Note 1:	



Radiated emissions
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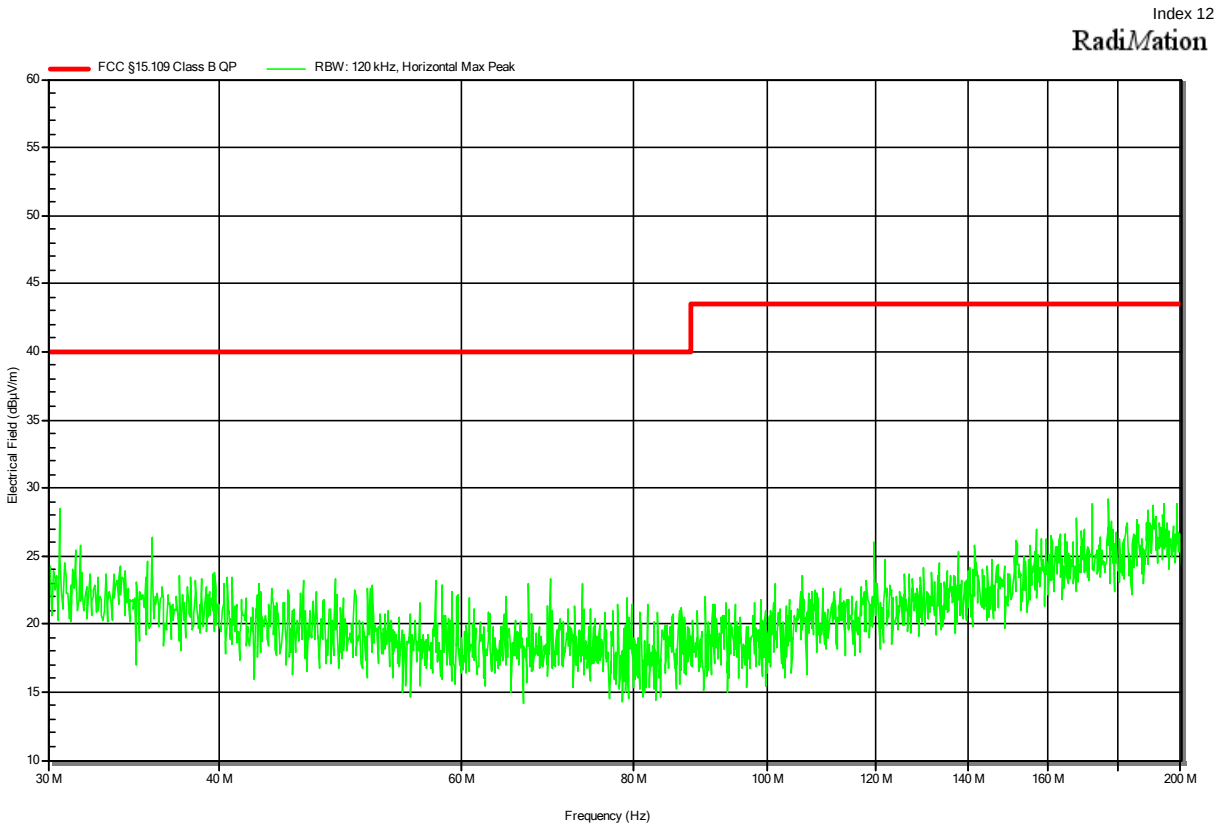
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 1
Note 1:	



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Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 2x1.5V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 1
Note 1:	

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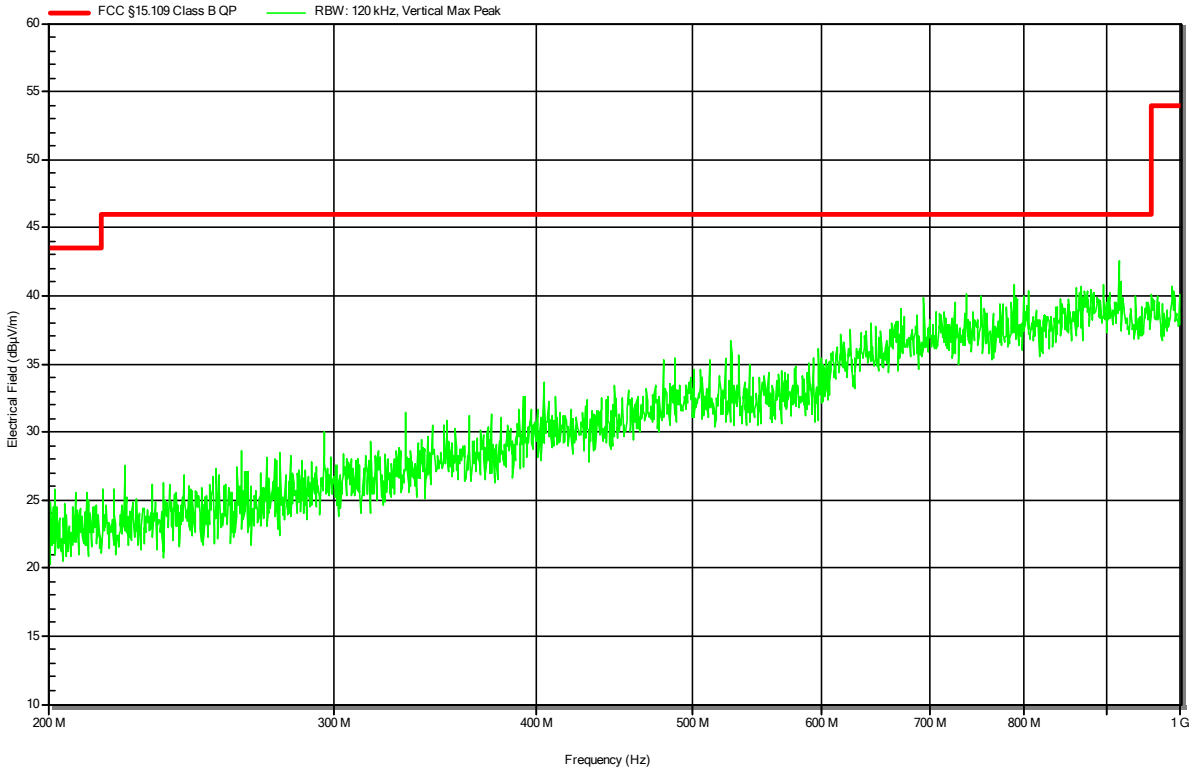
RadiMation



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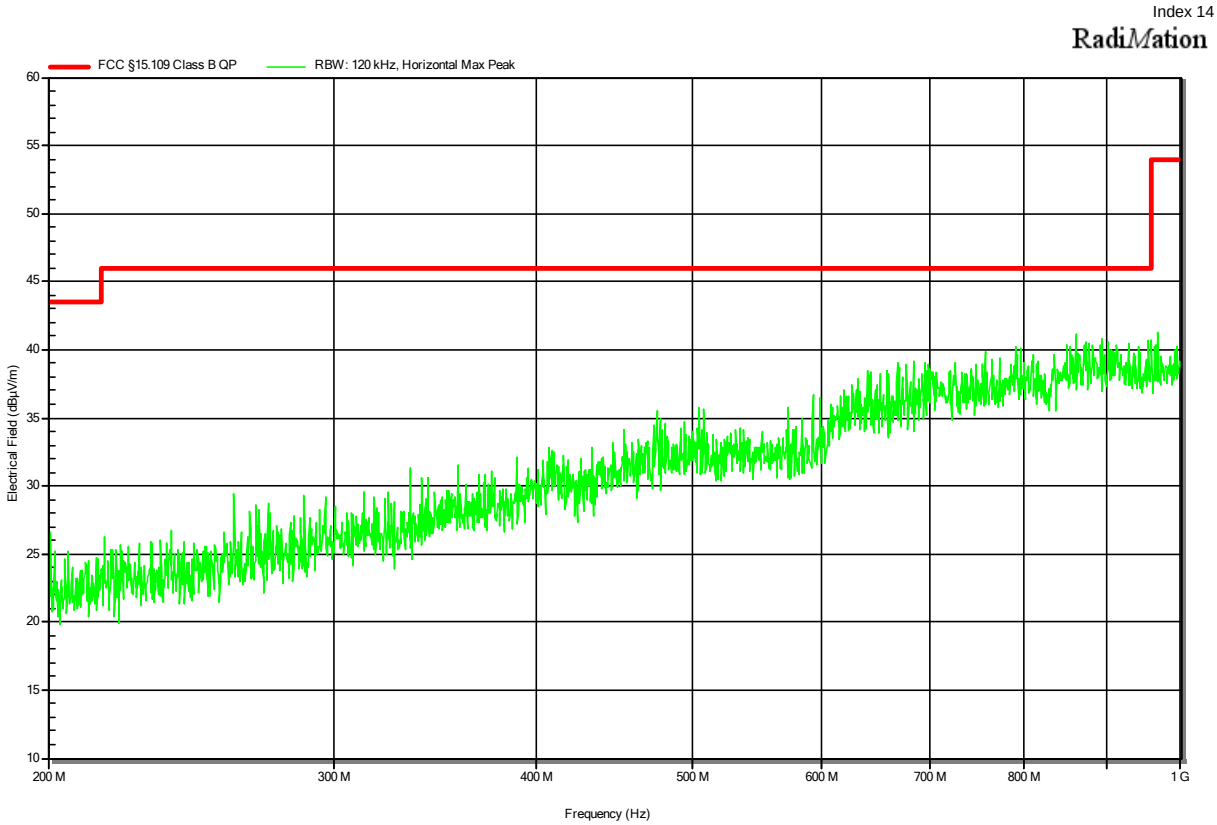
Operating Conditions:	ambient temperature: 22 °C power input: 2x1.5V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 1
Note 1:	



Radiated emissions
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Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 2x1.5V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 1
Note 1:	

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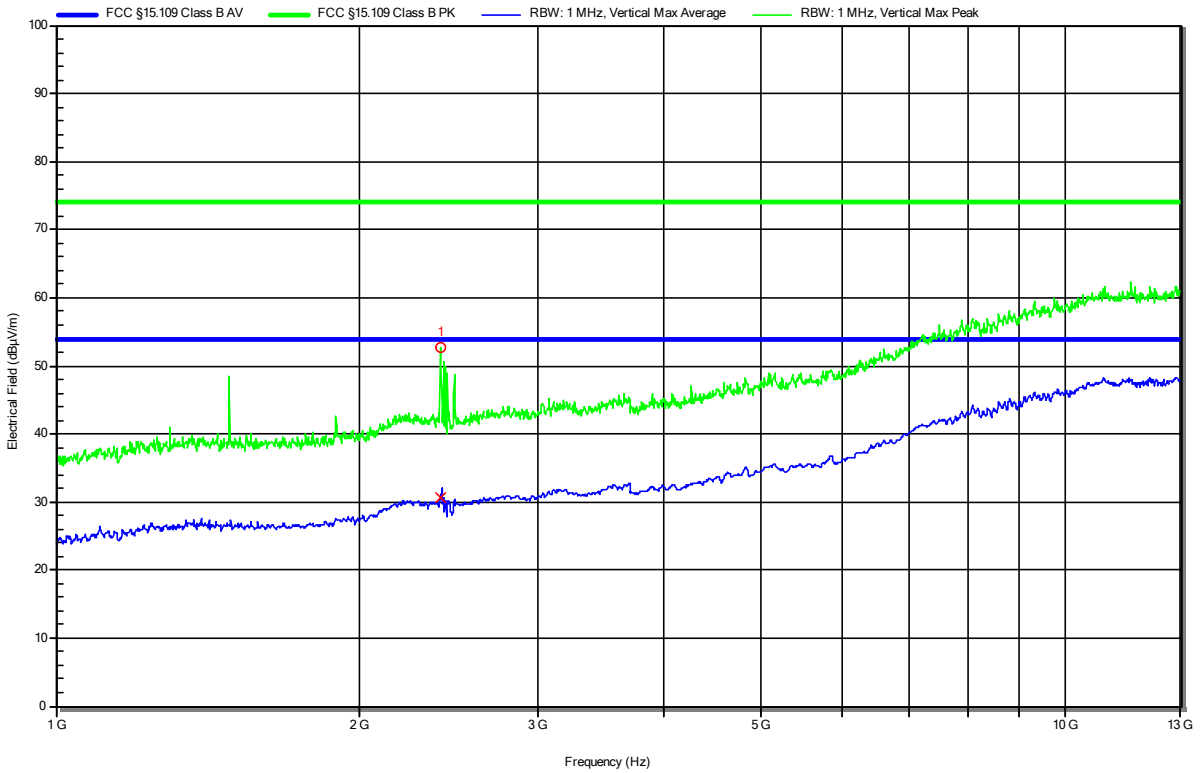
RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.402 GHz	Bluetooth carrier					

Radiated emissions
according to FCC part 15B

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Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 2x1.5V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 1
Note 1:	

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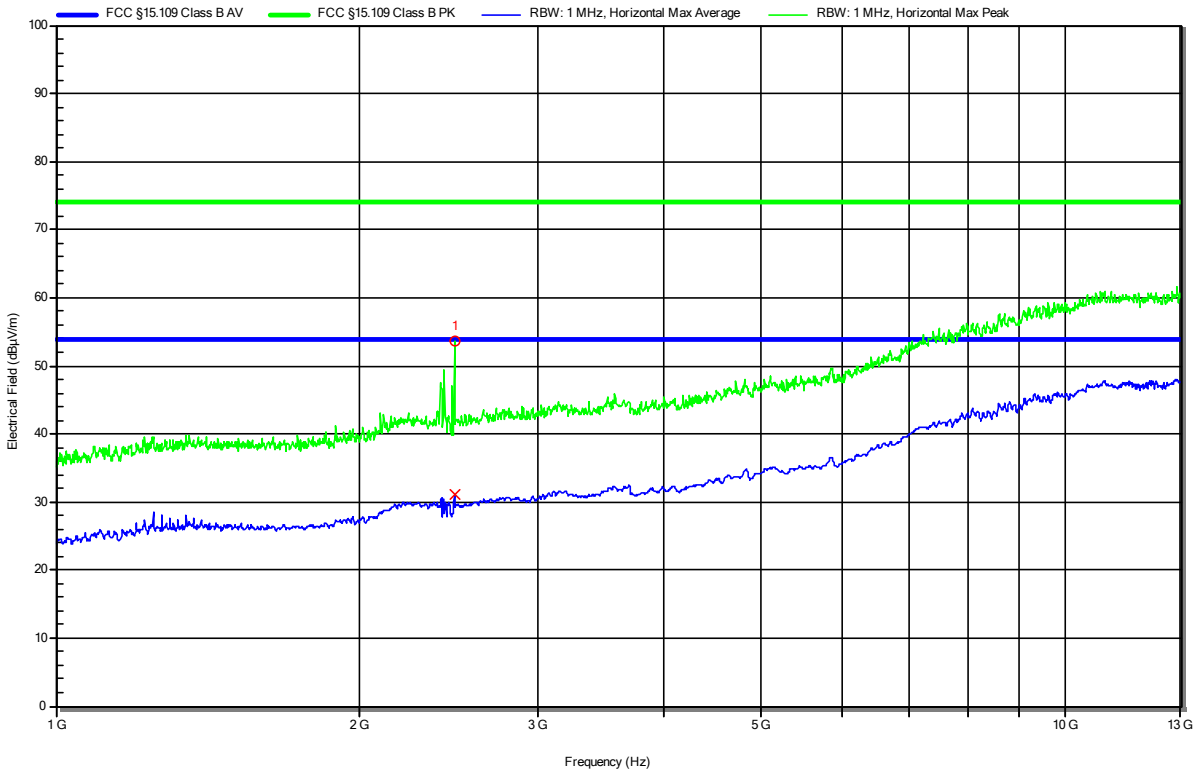
RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.481 GHz	Bluetooth carrier					

Radiated emissions
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Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 3.7V DC Lithium battery
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 2
Note 1:	

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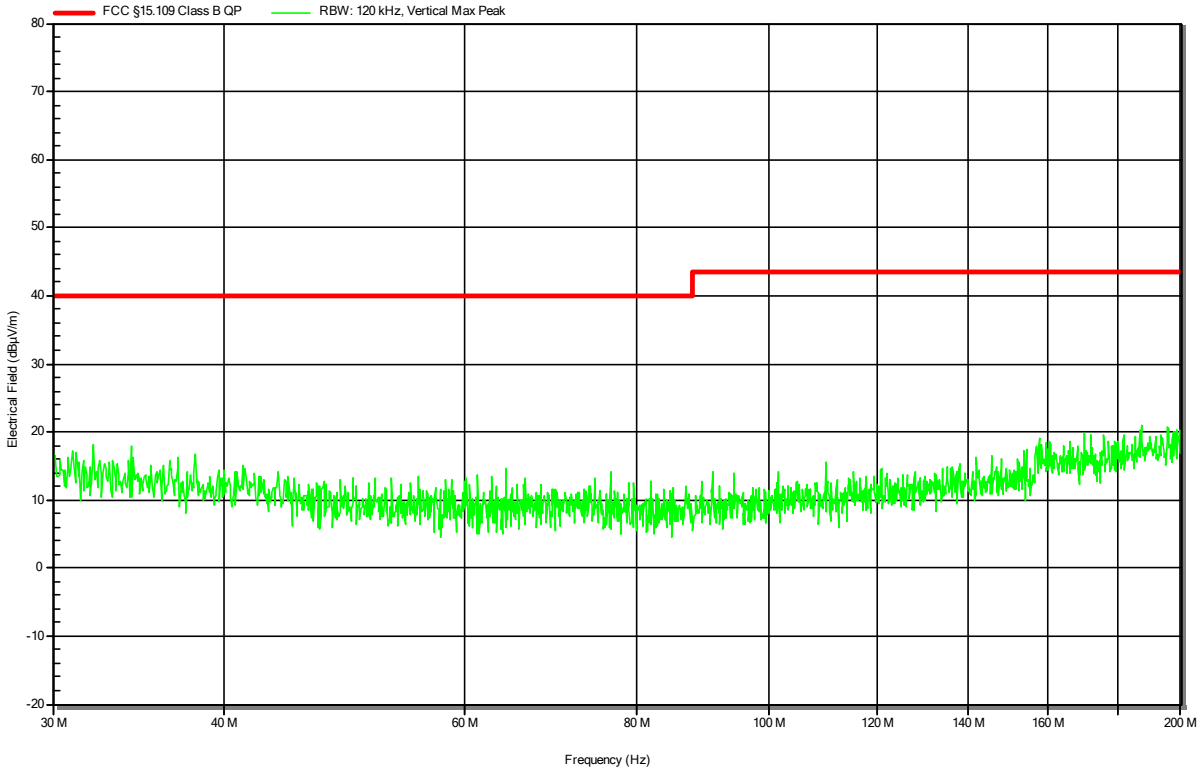
RadiMation



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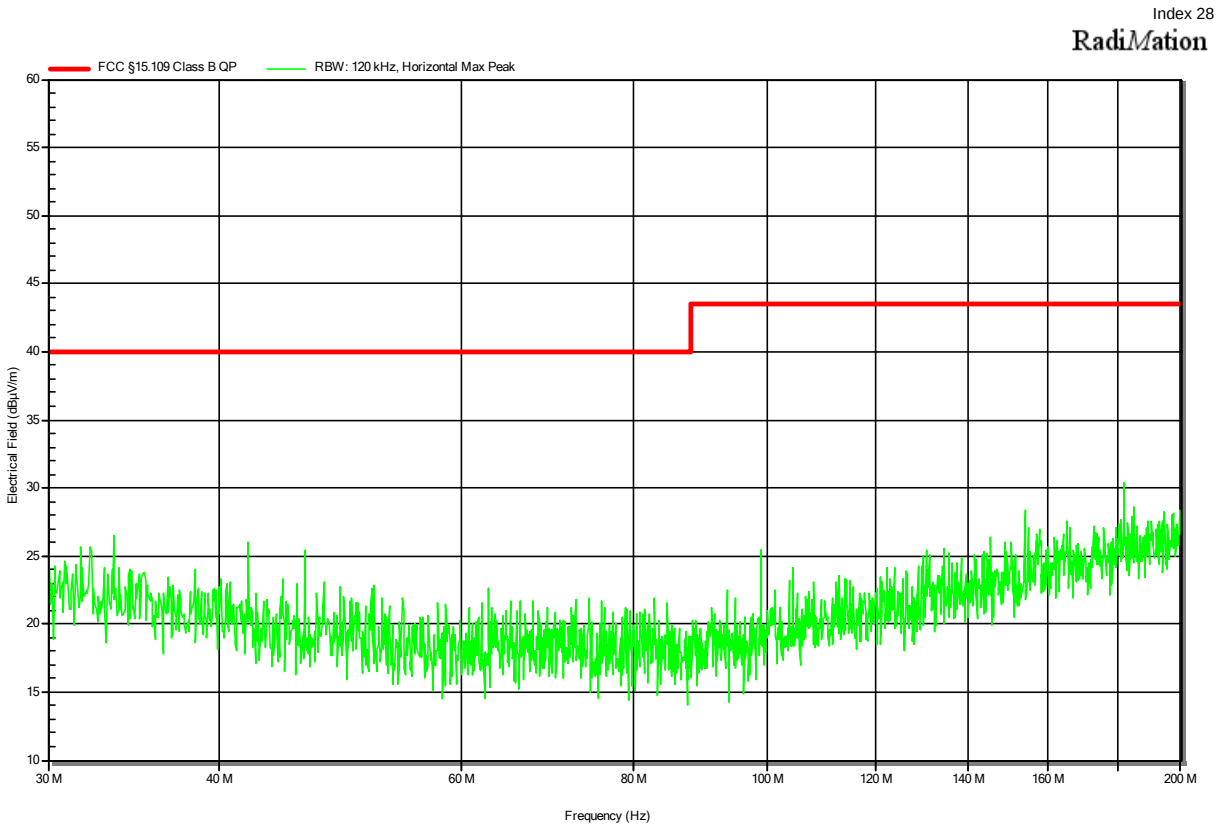
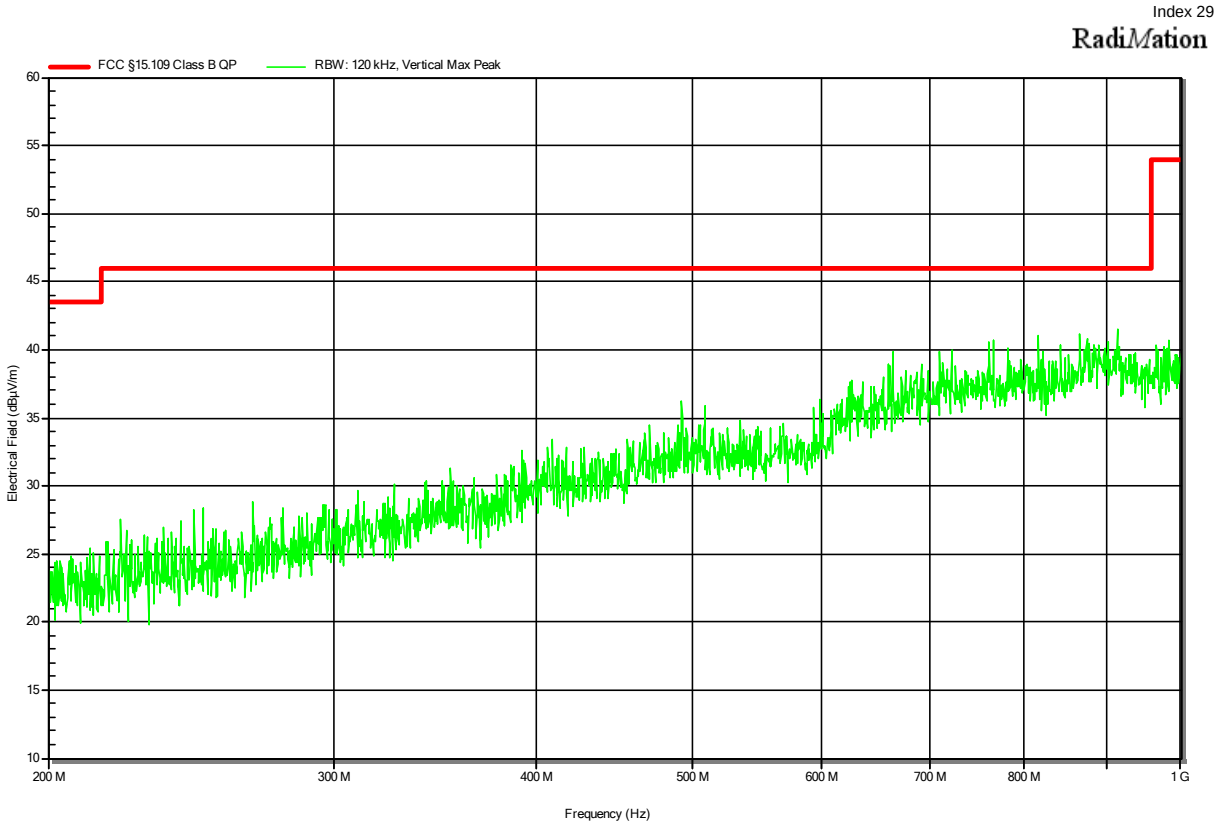
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 3.7V DC Lithium battery
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 2
Note 1:	



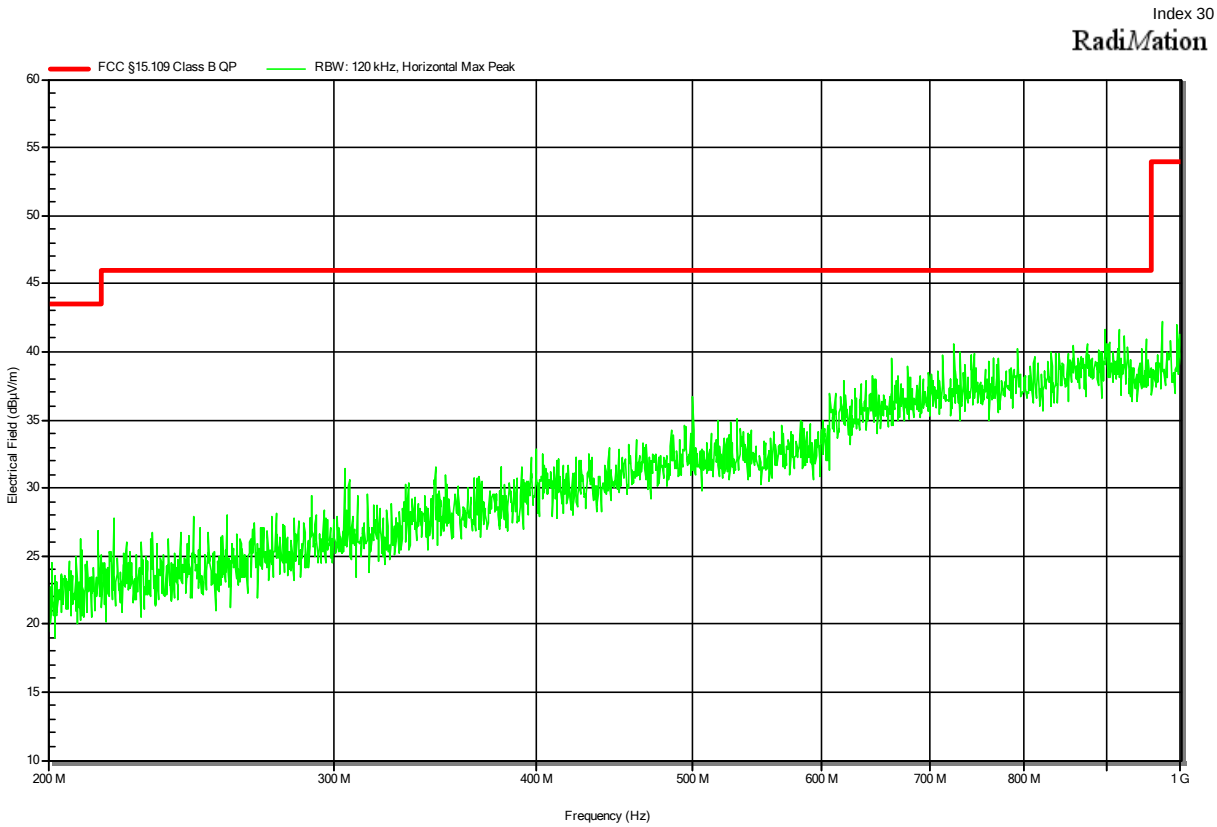
Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 3.7V DC Lithium battery
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 2
Note 1:	



Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 3.7V DC Lithium battery
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 2
Note 1:	



Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 3.7V DC Lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 2
Note 1:	

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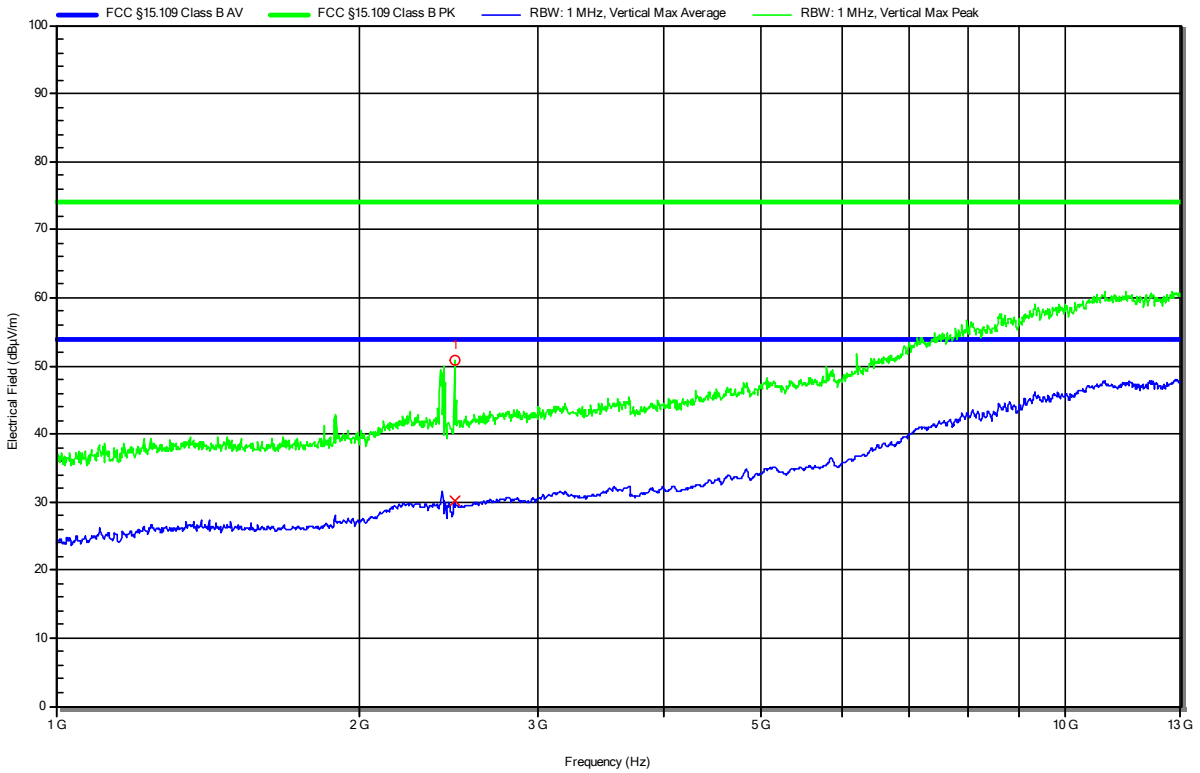
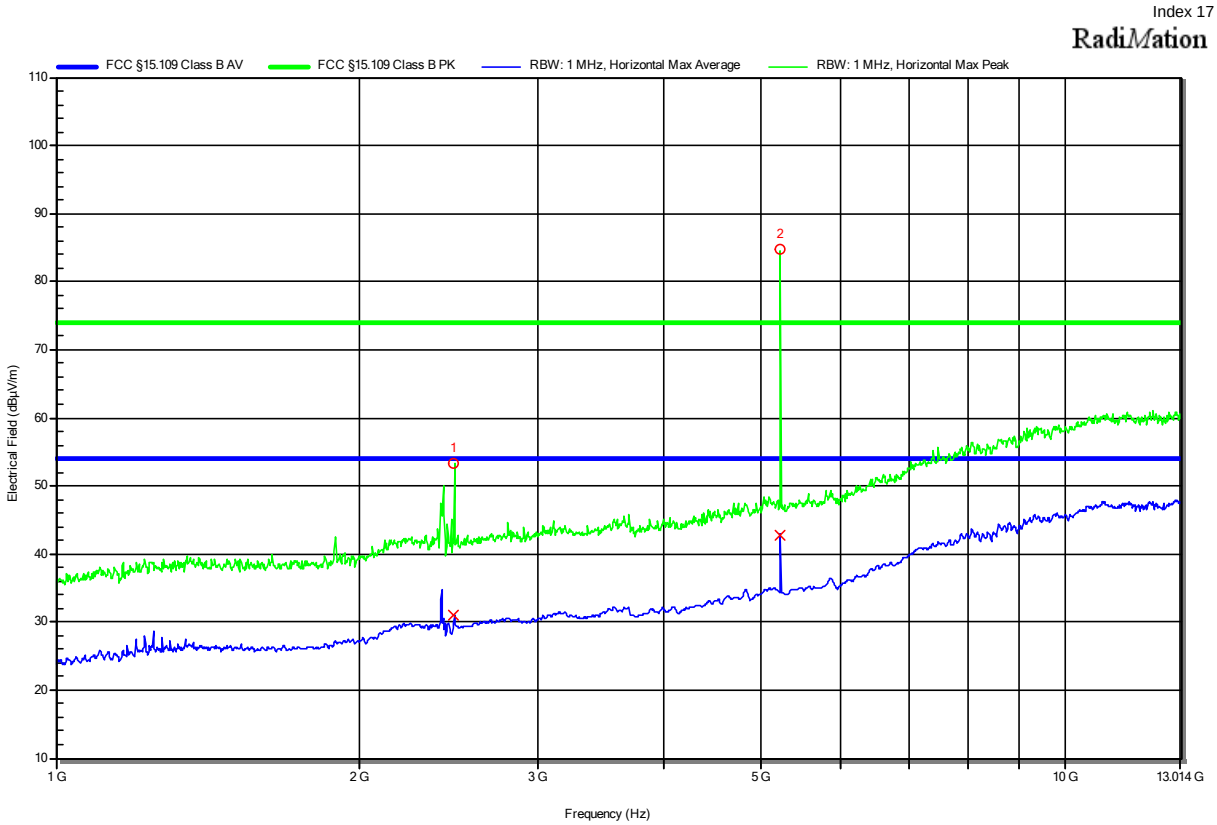


Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.481 GHz	Bluetooth carrier					

Radiated emissions
according to FCC part 15B

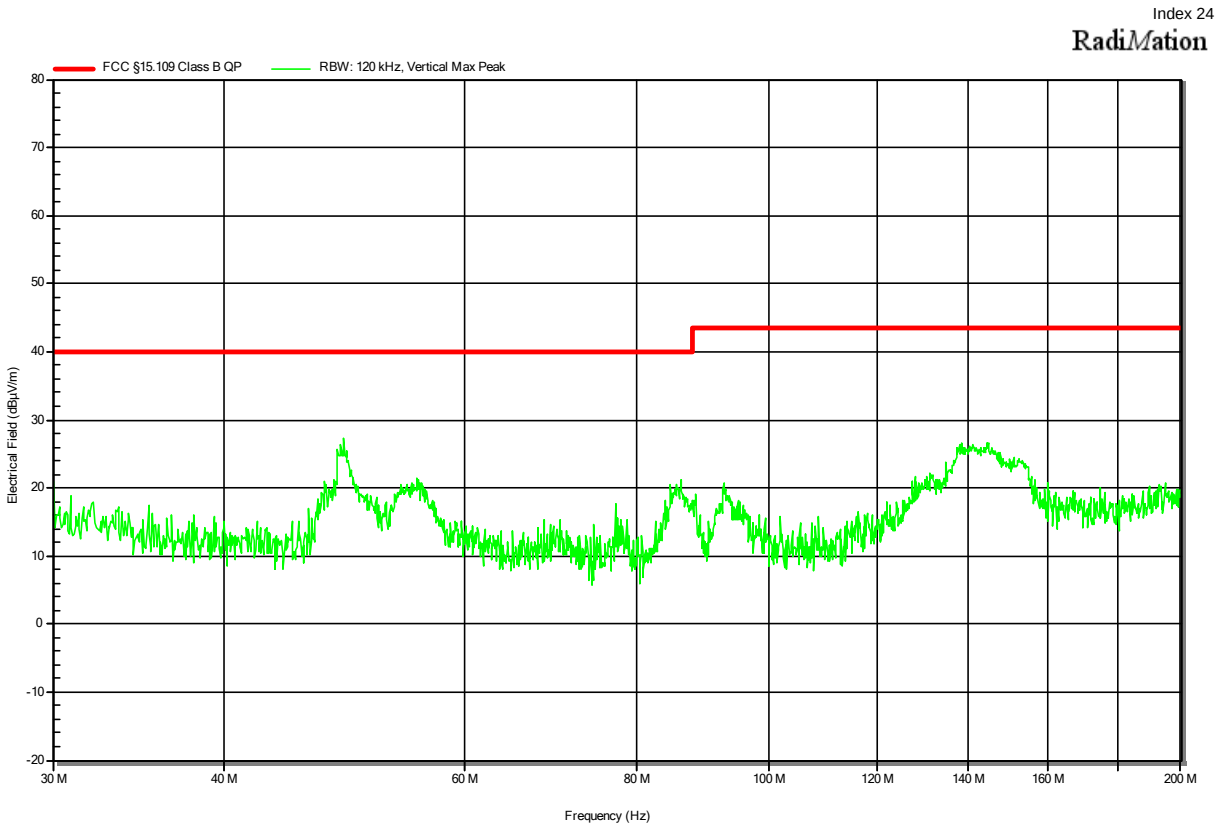
Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 3.7V DC Lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 2
Note 1:	



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.481 GHz	Bluetooth carrier					
2	5.216 GHz	2nd Harmonic					

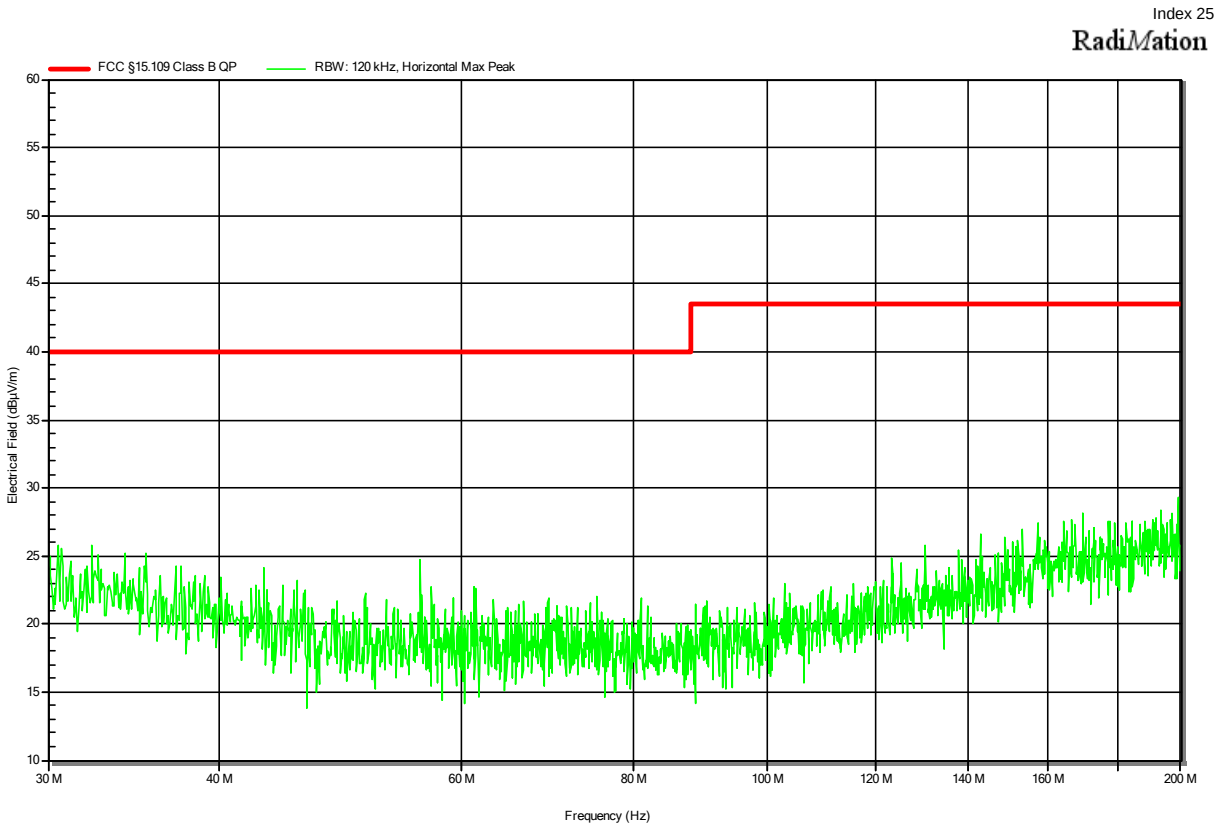
Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 120V AC (AC/DC adaptor)
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 3
Note 1:	



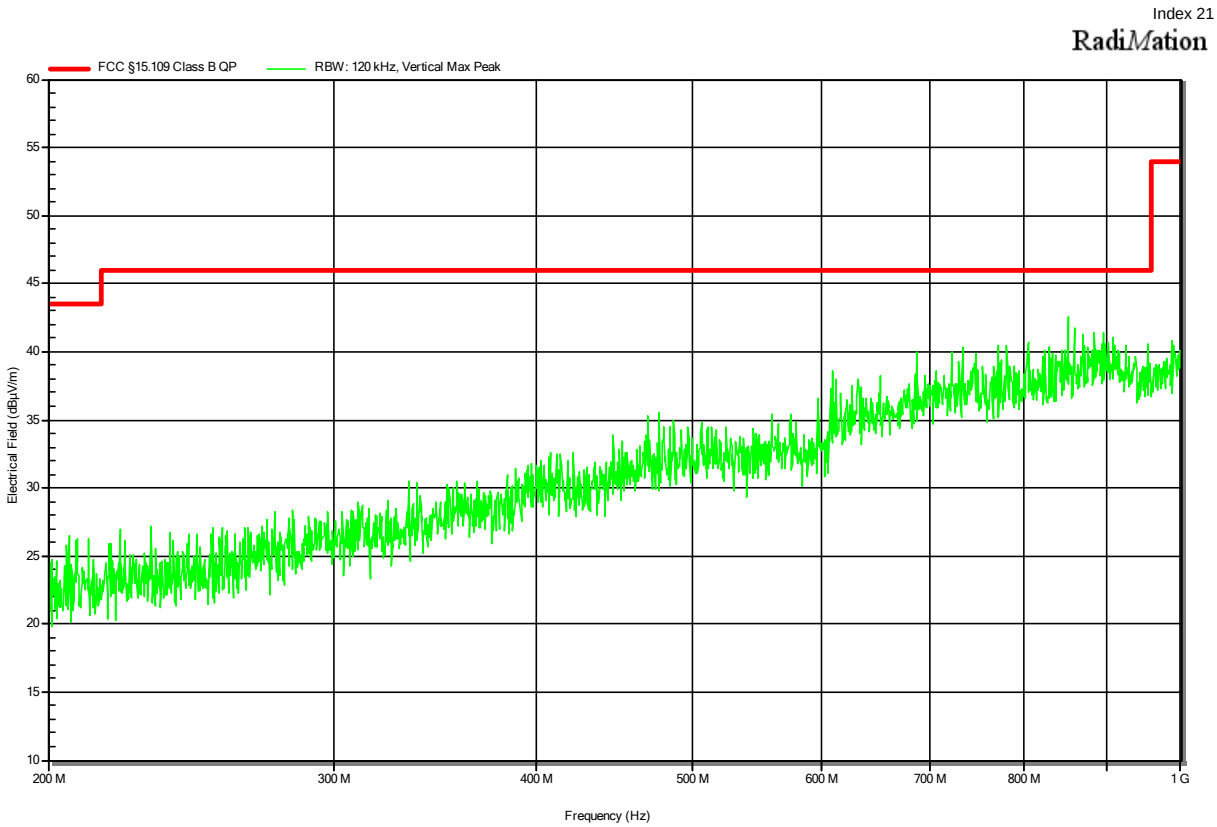
Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 120V AC (AC/DC adaptor)
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 3
Note 1:	



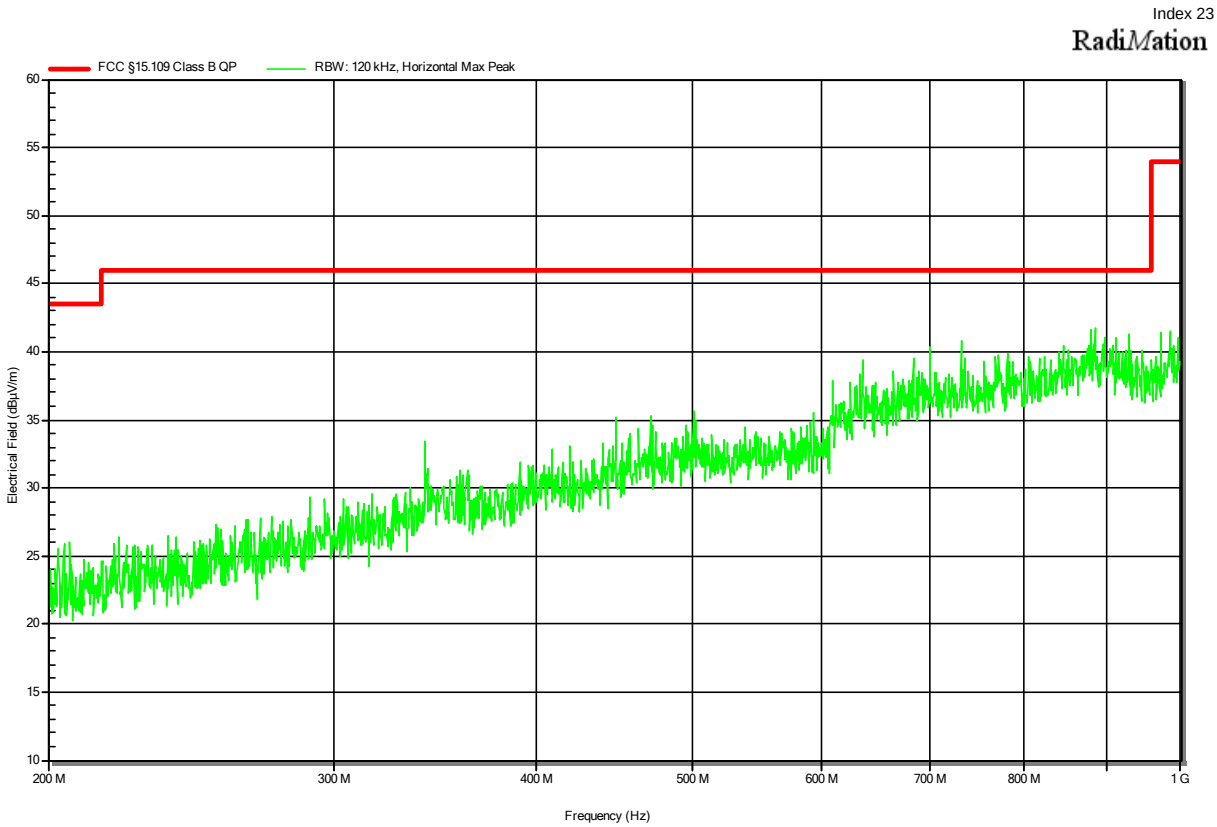
Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 120V AC (AC/DC adaptor)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 3
Note 1:	



Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 120V AC (AC/DC adaptor)
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 3
Note 1:	



Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 120V AC (AC/DC adaptor)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 3
Note 1:	

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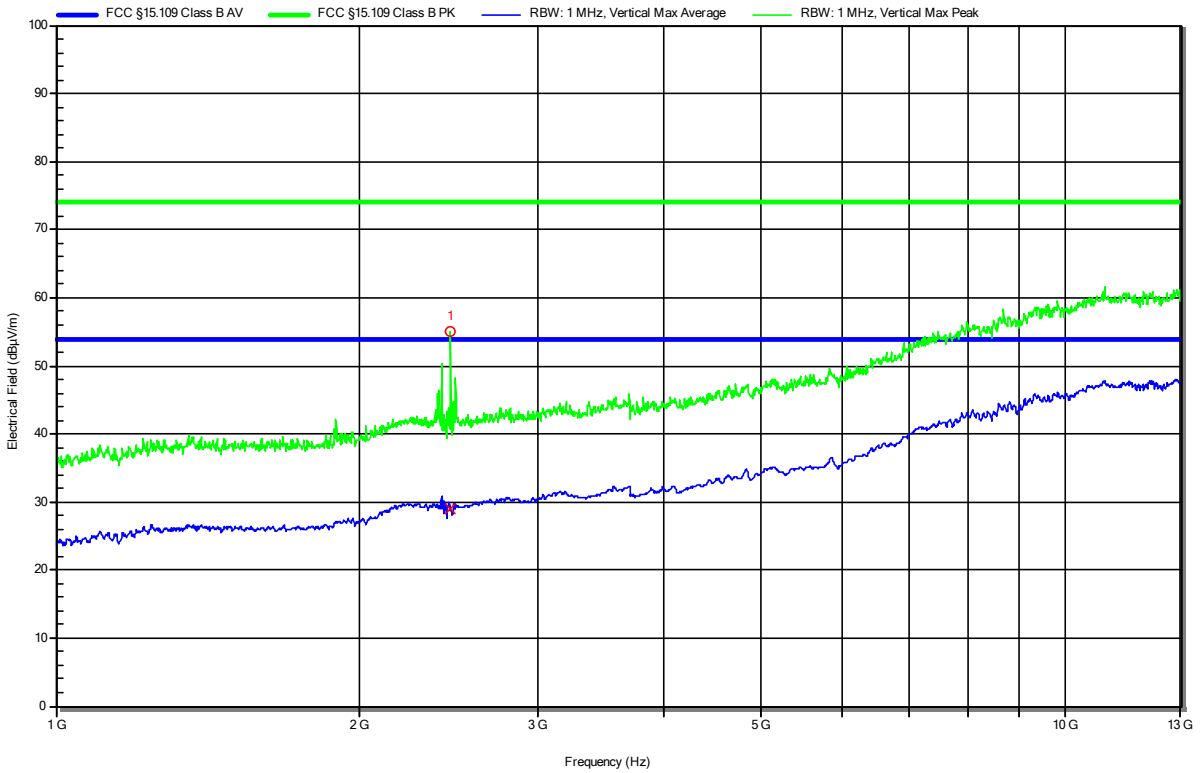

Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.46 GHz	Bluetooth carrier					

Radiated emissions
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 120V AC (AC/DC adaptor)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 3
Note 1:	

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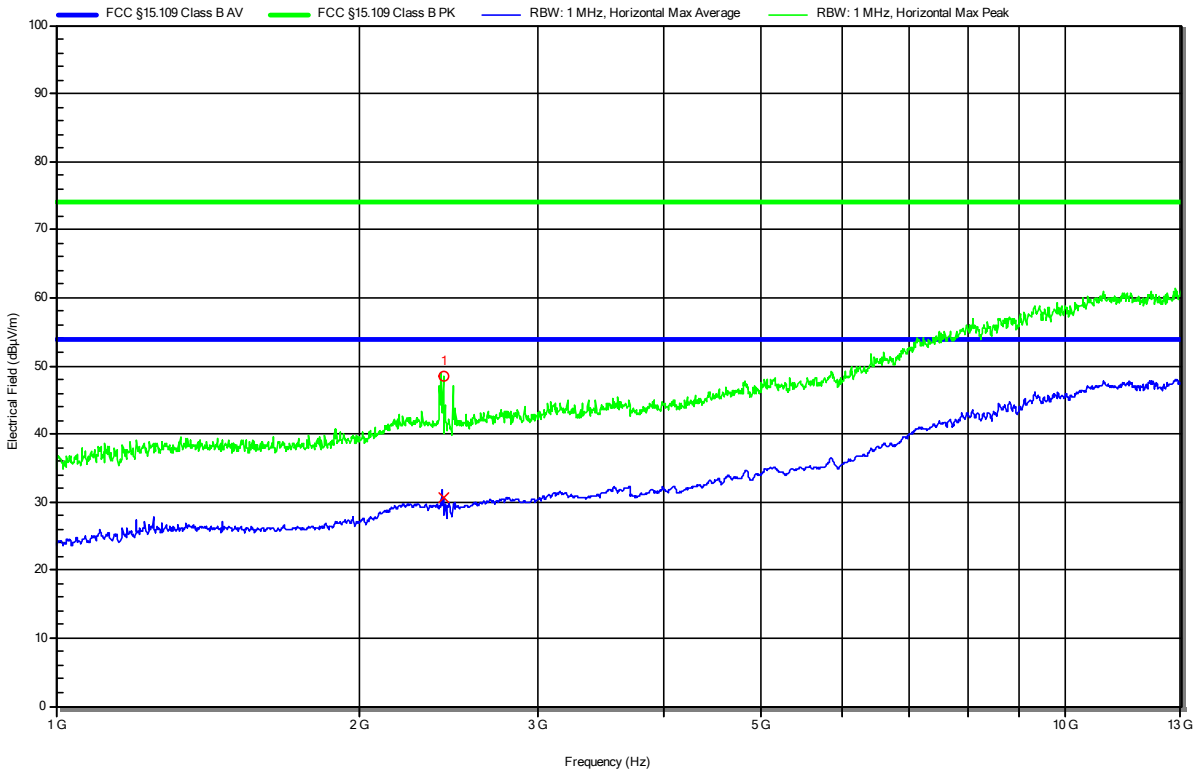
RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.418 GHz	Bluetooth carrier					

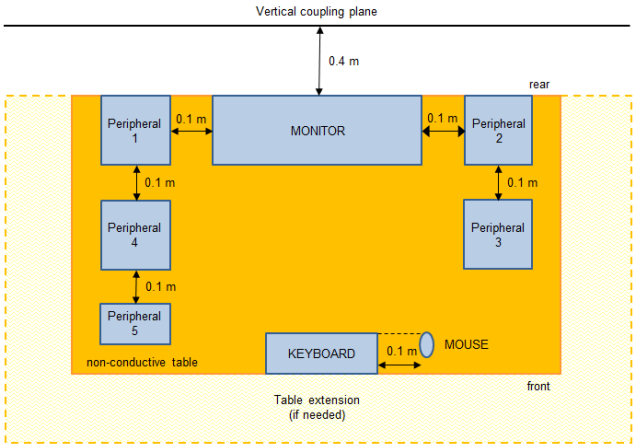
2.2 Test Conditions and Results - Conducted emissions acc. to ANSI C63.4

2.2.1 Information

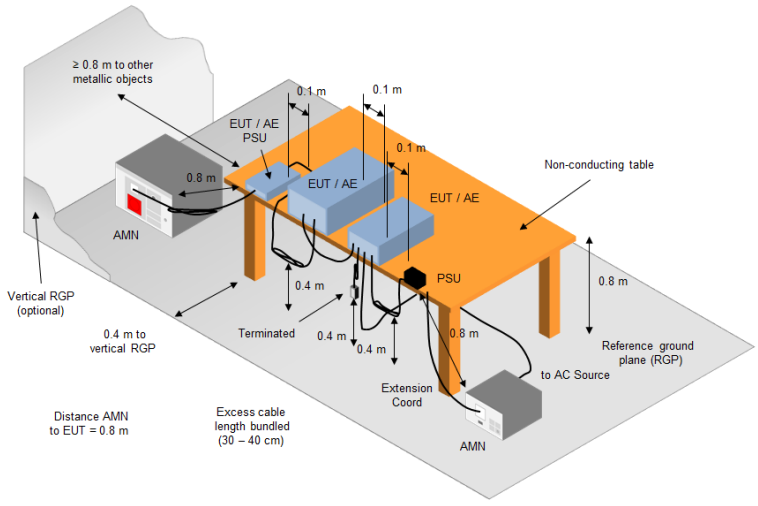
Test Information	
Reference	FCC 15.107, ICES-003, 3.2.1
Reference method	ANSI C63.4:2014+A1:2017 Section 12
Measurement range	150 kHz to 30 MHz
Equipment class	Class B
Equipment type	Table top
Temperature [°C]	22 ±3
Humidity [%]	37 ±3
Operator	Matthias Handrik
Date	2020-11-20
Comment	

2.2.2 Setup

Equipment placement



Test Setup



2.2.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Pulse Limiter	R&S	ESH3-Z2	EF01222	2020-07	2021-07
LISN	Schwarzbeck	NSLK 8127 RC	EF01592	2020-07	2021-07
EMI Test Receiver	R&S	ESR 7	EF00943	2020-07	2021-07
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2020-03	2021-03

2.2.4 Procedure

Exploratory measurement
1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1)
2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).
4. The LISN measurement port was connected to a measurement receiver
5. I/O cables were bundled not longer than 0.4 m
6. Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor
7. To maximize the emissions the cable positions were manipulated
8. The worst configuration of EUT and cables is shown on a test setup picture at item 2.2.2

Final measurement
1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1)
2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).
4. The LISN measurement port was connected to a measurement receiver
5. The EUT and cable arrangement were based on the exploratory measurement results
6. The test data of the worst-case conditions were recorded and shown on the next pages

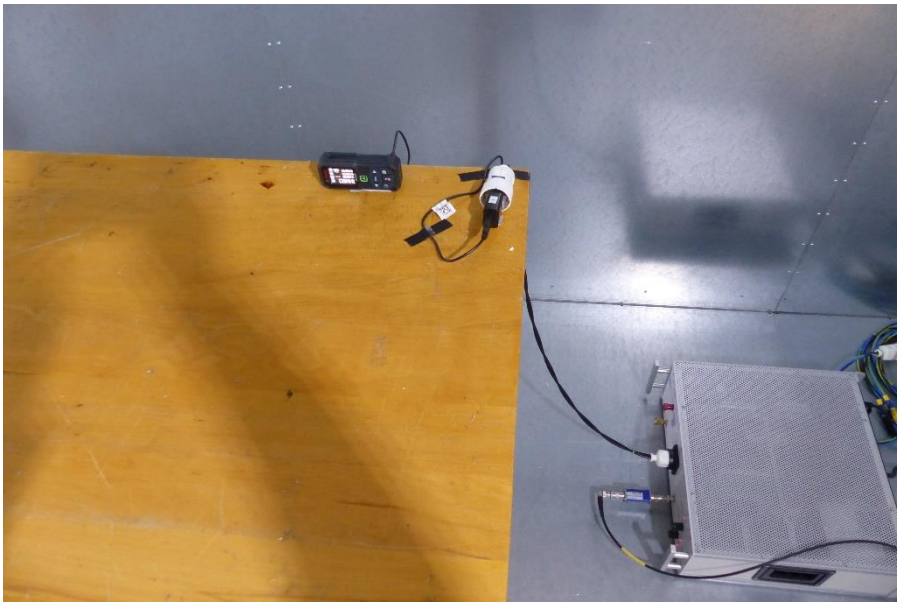
2.2.5 Limits

Class B		
Frequency [MHz]	Quasi-peak Limit [dBµV]	Average Limit [dBµV]
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5	56	46
5 - 30	60	50
* Decreases with the logarithm of the frequency		

2.2.6 Results

AC power line conducted emissions					
Port	Coupling	Operational mode	EUT Configuration	Verdict	Remark
AC	AMN	1	3	PASS	-

2.2.7 Setup Photos

Test setup


2.2.8 Records

Conducted emissions at the mains power port
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 120V AC (AC/DC adaptor)
LISN:	Schwarzbeck NSLK 8127 RC N
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 3
Applied to Port:	AC-Mains
Note 1:	

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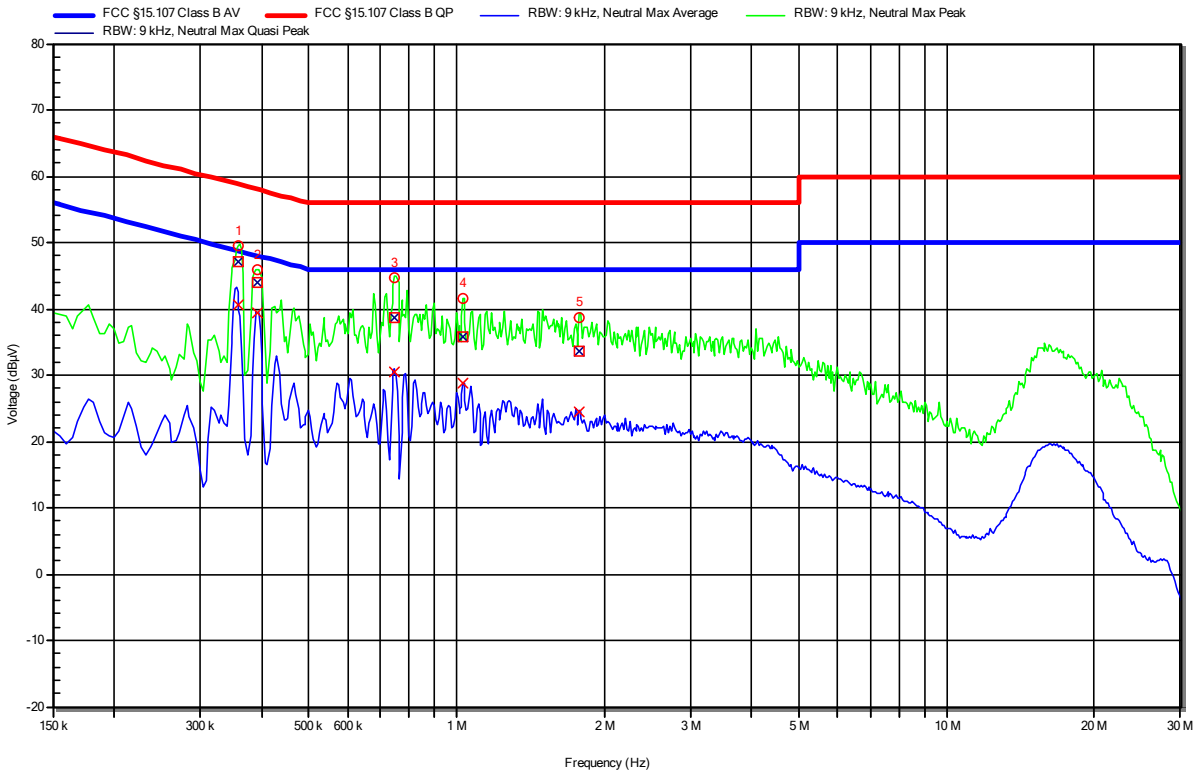
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	358.35 kHz	47.15 dBµV	58.77 dBµV	-11.62 dB	Pass	Neutral
2	391.2 kHz	44 dBµV	58.04 dBµV	-14.04 dB	Pass	Neutral
3	747.6 kHz	38.67 dBµV	56 dBµV	-17.33 dB	Pass	Neutral
4	1.032 MHz	35.9 dBµV	56 dBµV	-20.1 dB	Pass	Neutral
5	1.782 MHz	33.67 dBµV	56 dBµV	-22.33 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	358.35 kHz	40.52 dBµV	48.77 dBµV	-8.24 dB	Pass	Neutral
2	391.2 kHz	39.49 dBµV	48.04 dBµV	-8.55 dB	Pass	Neutral
3	747.6 kHz	30.45 dBµV	46 dBµV	-15.55 dB	Pass	Neutral
4	1.032 MHz	28.7 dBµV	46 dBµV	-17.3 dB	Pass	Neutral
5	1.782 MHz	24.47 dBµV	46 dBµV	-21.53 dB	Pass	Neutral

Conducted emissions at the mains power port
according to FCC part 15B

Project Number:	G0M-2002-8799
Applicant:	Robert Bosch Tool Corporation
Model Description:	Laser Rangefinder
Model:	GLM165-27CG
Test Sample ID:	31712
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2020-11-20
Operating Conditions:	ambient temperature: 22 °C power input: 120V AC (AC/DC adaptor)
LISN:	Schwarzbeck NSLK 8127 RC L
Operational Mode & EUT Configuration:	Operational Mode 1 EUT configuration 3
Applied to Port:	AC-Mains
Note 1:	

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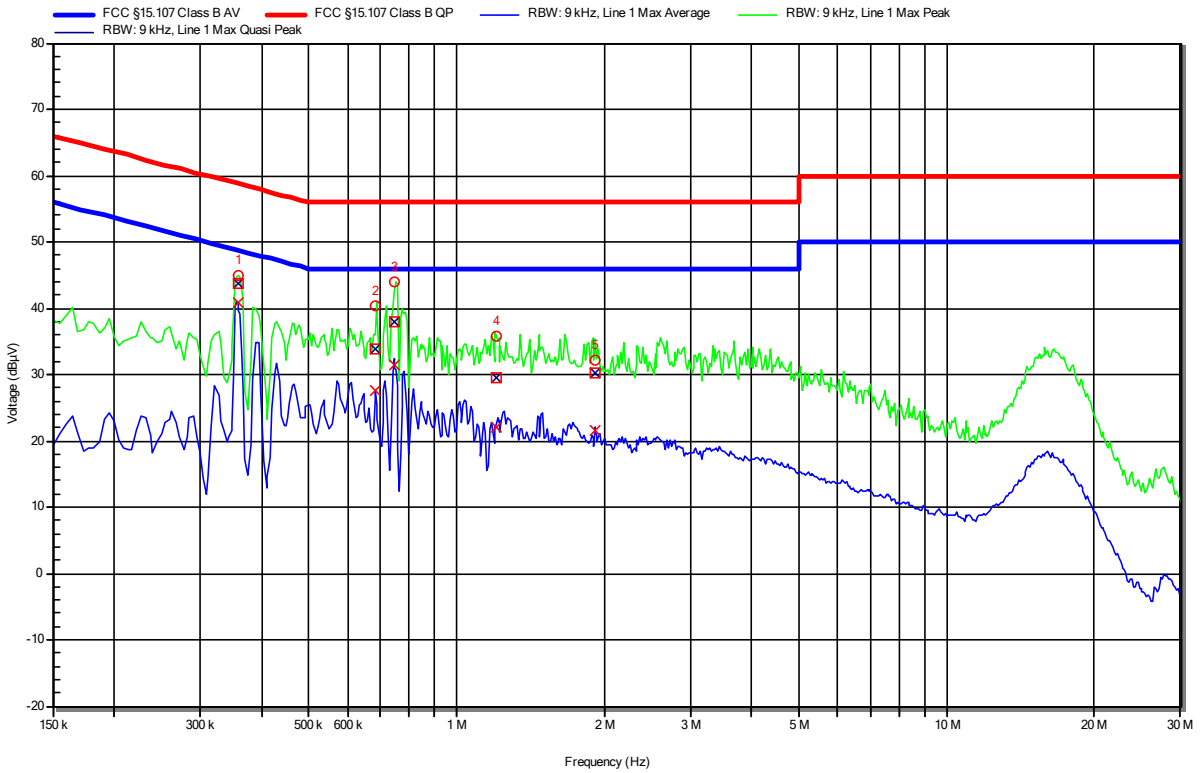
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	357.45 kHz	43.66 dBµV	58.79 dBµV	-15.13 dB	Pass	Line 1
2	685.05 kHz	33.93 dBµV	56 dBµV	-22.07 dB	Pass	Line 1
3	748.95 kHz	37.98 dBµV	56 dBµV	-18.02 dB	Pass	Line 1
4	1.203 MHz	29.57 dBµV	56 dBµV	-26.43 dB	Pass	Line 1
5	1.911 MHz	30.22 dBµV	56 dBµV	-25.78 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	357.45 kHz	40.85 dBµV	48.79 dBµV	-7.94 dB	Pass	Line 1
2	685.05 kHz	27.62 dBµV	46 dBµV	-18.38 dB	Pass	Line 1
3	748.95 kHz	31.46 dBµV	46 dBµV	-14.54 dB	Pass	Line 1
4	1.203 MHz	22.12 dBµV	46 dBµV	-23.88 dB	Pass	Line 1
5	1.911 MHz	21.6 dBµV	46 dBµV	-24.4 dB	Pass	Line 1